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Illinois
Environmental
Protection Agency

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OZONE

the pervasive pollutant

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* OZONE *

THE PERVASIVE POLLUTANT

Understanding the Problem

Ozone is both a blessing and a curse. In the lower atmosphere ozone is harmful to crops, forests, materials and the health of humans and animals; in the upper atmosphere, ozone absorbs the harmful rays (ultraviolet-B) of sunlight.

The continuing depletion of the upper ozone layers is a serious concern. Unfortunately, harmful ozone in the lower atmosphere does not move up to replenish the deteriorating ozone layer in the high reaches of atmosphere. The remainder of this brochure is concerned only with ozone in the lower level of the atmosphere.

Ozone in the lower atmosphere, often called smog, continues to be one of our most pervasive air pollution problems. Many areas of the country do not now meet current health and welfare standards of ozone, and probably will not do so in the foreseeable future.

Ozone is Elusive

Unlike the other major air pollutants, ozone is not emitted directly into the air but is formed through complex chemi-

cal reactions between nitrogen oxides and volatile organic compounds (VOCs) in the presence of sunlight. Weather conditions which are conducive to ozone formation included days which are warm and sunny with little wind and no rainfall. When these stagnating conditions occur over several days ozone can continue to build up to higher levels. Since ozone is formed in the atmosphere, it can be transported long distances and result in unhealthy concentrations in areas that are downwind of urban centers.

While ozone is not actually emitted from smokestacks and tailpipes, it is

an indirect product of our industrial/automotive age. Ozone precursors are not emitted from a few large or conveniently concentrated sources, but from numerous sources, large and small, in diverse locations. These sources include motor vehicles, petroleum refineries, oil storage tanks, household products, petroleum marketing, chemical manufacturing, surface coating and printing industries.

Ozone levels are usually highest in the afternoon and early evening after traffic has released large amounts of contaminants

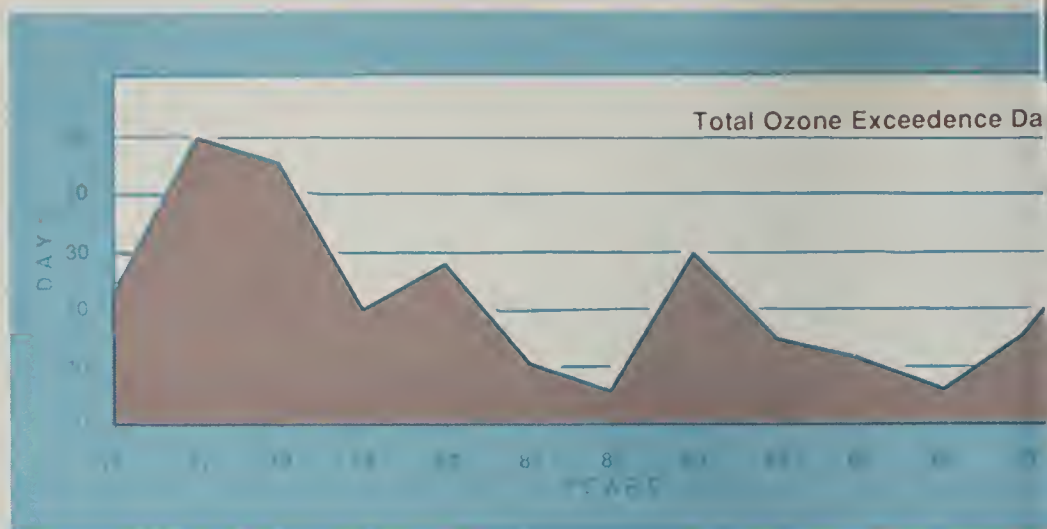
and while industries using solvent-based compounds are operating.

Health Effects

New and emerging scientific data are shedding more light on the ozone levels currently being encountered in many American cities. Some scientists believe that existing air-quality standards may provide little or no margin of safety. Perhaps the most significant new finding is that ozone not only affects people with impaired respiratory systems, such as asthmatics, but also many people with healthy lungs, both children and adults.

Healthy individuals who are exercising while ozone levels are at or slightly above the standard can experience reduced functioning of the lungs, leading to chest pain, coughing, wheezing and pulmonary congestion.

In animal studies, long-term exposure to high levels of ozone has produced permanent structural damage to animal lungs while both short- and long-term exposure have been found to decrease the animal's capability to fight infection.



Those Affected by High Ozone

While healthy people are sometimes affected by high ozone levels, many persons are especially sensitive to its damaging effects. These include:

- the elderly;
- infants and children;
- athletes;
- chronic respiratory patients;
- persons with a history of chest discomfort or respiratory allergies;
- persons being treated for lung cancer;

persons with cardiovascular disease.

Others who may be affected are pregnant women, athletes and smokers.

Some of the symptoms of high ozone levels are:

- tiredness and lightheadedness;
- throat irritation;
- exaggerated chronic conditions;
- coughing and wheezing;
- chest discomfort;
- reduced work performance.

Recent U.S. Environmental Protection Agency estimates suggest there are 20 million to 30 million ozone-sensitive people in those major urban areas where levels are 25 percent or more above the current health standard. Equally high levels are often recorded in rural sectors downwind from these metropolitan areas.

Protecting Yourself Against High Ozone Levels

In general, ozone levels are highest in the afternoon on hot summer days. Plan your strenuous activities at other times. If you begin to feel discomfort or difficulty in breathing, consult your physician.

Also:

Avoid heavy exertion or even remain indoors,

*Do not smoke,
Avoid smoke-filled areas,
Avoid exposure to irritants such as bleaches, ammonias and glues,
Do not sweep, vacuum, dust or use powered detergents and soaps,
Avoid the use of aerosols,
Avoid driving, especially in congested areas.*

Welfare Concerns

Not only has new evidence produced growing concern over the health effects of ozone, but now there is much clearer evidence that ozone adversely affects vegetation and some forests. Evidence from scientific studies of vegetation indicates that ozone can reduce plant yield in tomato, bean, soybean, snap bean, peanut and corn crops. The potential agricultural losses are es-

timated to be \$2 to \$3 billion per year. Ozone also has an impact on forests, causing premature leaf-drop and lower growth rates. Materials damage attributed to ozone includes cracking of rubber products, weakening of textiles, changes in dyes and premature cracking of paint.

What Can Be Done

Ozone continues to be one of the country's most pervasive but unrecognized air pollution challenges. Some 15 years experience in trying to solve the ozone problem has revealed that controlling substances generated just about everywhere by a great variety of processes is a complex task.

Air pollution regulations on industry have reduced some emissions,

but more will have to be controlled. Motor vehicle traffic is growing so fast that even strenuous control efforts may not sufficiently reduce emissions.

Citizens should be aware of what control programs are being considered by their states and should take an active role in planning carrying out effective air-pollution control measures.

In addition, you can help reduce emissions from the small sources which you control. Keep motor vehicles properly tuned and drive no more than necessary. Use water-based or solvent-free paints instead of oil-based or solvent-based paints. And, whenever feasible, use only solvent-free household products.

Keeping a Watch on Ozone Levels

The Illinois Environmental Protection Agency continually monitors air quality throughout the state. Air quality monitors report data in hourly averages to the IEPA headquarters in Springfield. When the ozone level reaches above 120 parts per billion, the IEPA issues special unhealthful air quality statements for the affected area(s). If the unhealthful conditions are forecasted to reoccur the next day, an ozone advisory is issued.

Index Value	Health Effect Categories	Health Effects	Preventative Measures
400-500	Very Hazardous	Premature death of ill and elderly. Healthy people will experience adverse symptoms that affect their normal activity.	All persons should remain indoors, keeping windows and doors closed. All persons should minimize physical exertion and avoid traffic.
300-399	Hazardous	Premature onset of certain diseases in addition to significant aggravation of symptoms and decreased exercise tolerance in healthy persons.	Elderly and persons with existing diseases should stay indoors and avoid physical exertion. General population should avoid outdoor activity.
200-299	Very Unhealthful	Significant aggravation of symptoms and decreased exercise tolerance in persons with heart or lung disease, with wide-spread symptoms in the healthy population.	Elderly and persons with existing heart or lung disease should stay indoors and avoid physical exertion and outdoor activity.
100-199	Unhealthful	Mild aggravation of symptoms in susceptible persons, with irritation symptoms in the healthy population.	Persons with existing heart or respiratory ailments should reduce physical exertion and outdoor activity.





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